Trend Study 16C-13-04

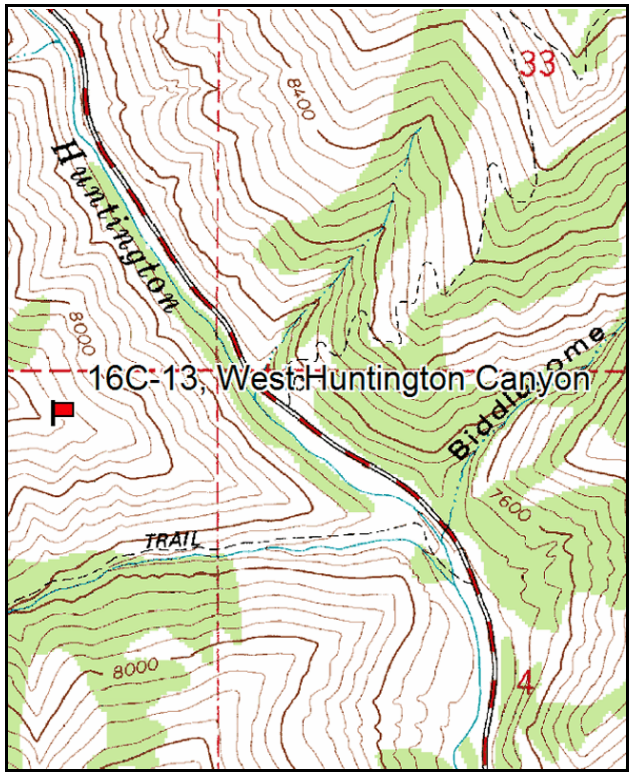
Study site name: West Huntington Canyon . Vegetation type: Curlleaf Mnt Mahogany .

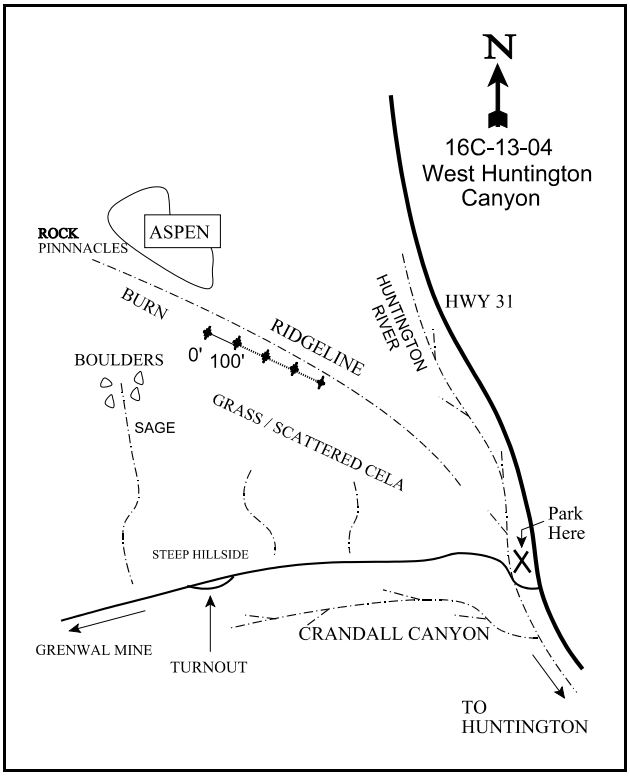
Compass bearing: frequency baseline 117 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Highway 31, the Huntington Canyon road, turn onto the Crandall Canyon road. From the turnout, look up the ridge to the north. The study site is on the top of the ridge on the eastern edge of an old burn; now sagebrush/grass and scattered mahogany. The site can be reached by a 1/4 mile hike up the steep rocky face, or a 3/4 mile hike up the ridge starting by the Huntington River. Once the top of the ridge below the rock pinnacles is reached, the study stakes are not difficult to locate. The 0-foot baseline stake is marked by browse tag #902S.





Map Name: Rilda Canyon

Diagrammatic Sketch

Township 16S , Range 7E , Section 5

GPS: NAD 27, UTM 12S 4368314 N, 486550 E

DISCUSSION

West Huntington Canyon - Trend Study No. 16C-13

This trend study is located on the west side of Huntington Canyon along the top of the ridge, north of Crandall Canyon. The south-facing slopes and ridge tops in this area are used by elk in the winter. Clumps of aspen also provide summering habitat for deer. The study is within a curlleaf mountain mahogany type that burned many years ago. Along with the sparse mahogany over story, there is an understory of bluebunch wheatgrass, Salina wildrye, Oregon grape, and mountain big sagebrush. This area does not appear to be used by livestock, probably due to its inaccessibility and lack of water. Pellet group data from 1999 estimated 10 deer and 96 elk days use/acre (25 ddu/ha, 237 edu/ha). All pellet groups appeared to be from the previous winter. Elk use was high in 2004, estimated at 131 elk days use/acre (322 edu/ha).

The study is on the south side of the ridge, just below the ridge top with a southeast aspect. The elevation is 8,400 feet. The slope is very steep (45%) and rocky. Cliffs are formed by exposure of the underlying sandstone. The rocky nature of the site allows for generally shallow soils, but there are deep spots between rocks which provide good rooting sites for trees. Effective rooting depth is actually quite deep and is estimated at just over 16 inches. Soil texture is a clay with a slightly alkaline pH (7.4). Phosphorus is limited at only 5.5 ppm. Values less than 10 ppm may limit normal plant growth and development. In spite of severe pedestalling and exposed roots, the large bluebunch wheatgrass and Salina Wildrye play a major role in holding the soil in place. For the most part, the soil is moderately protected. Erosion is inevitable due to the steepness of the slope, but it does not appear to be excessive. The erosion condition class determined erosion as moderate due to severe pedestalling, and soil and litter movement down slope.

The dominant overstory on the site consists of a few scattered mature curlleaf mountain mahogany, some of which are large, tree like, and mostly unavailable due to height and highlining. Smaller, more available mahogany sampled on the site are heavily browsed. Mountain big sagebrush, the key browse species, provides more than half of the browse cover. The population has remained relatively stable since 1994 at a density of about 1,500 plants/acre. Sagebrush has been mostly light to moderately browsed over all sampling periods. Vigor has also been good on most plants during all readings and the number of decadent plants has remained low. Snowberry, low rabbitbrush, pinyon, and Rocky Mountain juniper are present on the mountainside but in low numbers.

Salina wildrye is the most abundant grass followed by bluebunch wheatgrass. It appears that there was an identification problem between bluebunch wheatgrass and Salina wildrye in 1994. Salina wildrye provided 87% of the grass cover in 1999, increasing to 98% in 2004. Bluebunch wheatgrass declined significantly in nested frequency since 1999. Forbs are not abundant and only a few species, aster, and longleaf phlox are common.

1994 TREND ASSESSMENT

Ground cover characteristics have changed somewhat since 1988. Percent litter cover has declined considerably due to drought conditions and percent bare ground has increased. However, the herbaceous understory is abundant and adequately protects the soil from erosion indicating a stable soil trend for the time being. The browse trend is stable for the key browse species, mountain big sagebrush, but down for seedlings, and young. Percent decadency rates are low. Overall, trend for browse is stable. Trend for herbaceous understory is slightly down even with some improvements in species composition. Nested frequency for perennial grasses moderately declined, while nested frequency of forbs increased. The key herbaceous component is the perennial grasses which contribute to about 90% of the herbaceous cover. The Desirable Components Index (see methods) rated this site as fair with a score of 53 due to no recruitment of young shrubs, low shrub cover, and low perennial forb cover.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly down (2)
winter range condition (DC Index) - 53 (fair) Mountain big sagebrush type

1999 TREND ASSESSMENT

Trend for soil continues to be stable. Percent litter cover remains similar to 1994 estimates, but percent bare ground has declined. There is some enviable erosion occurring due to the steep slope. Pedestalling and terracing are evident, however the abundant herbaceous cover helps stabilize the soil. Trend for browse is stable. The key species, mountain big sagebrush has a relatively stable density of 1,760 plants/acre. Vigor is good, percent decadence is low, and use is light to moderate. The preferred curlleaf mountain mahogany occurs in low densities. It is moderately to heavily hedged where available. Trend for the herbaceous understory is stable. The dominate species is Salina wildrye which provides 87% of the grass cover, 74% of the herbaceous cover or 49% of the total vegetation cover. It appears that much of this grass was misidentified as bluebunch wheatgrass in 1994. Forbs are limited, yet they have increased slightly in nested frequency since 1994. Aster is the only abundant forb. The Desirable Components Index rated this site as good with a score of 69 due to low decadence, good shrub cover, and excellent perennial grass cover.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)
winter range condition (DC Index) - 69 (good) Mountain big sagebrush type

2004 TREND ASSESSMENT

Trend for soil is down slightly due to a 56% increase in cover of bare ground and a 20% decline in vegetation cover. Litter cover also declined. Some erosion is occurring due to the steep slope but it does not appear to be excessive. Trend for the key browse species, mountain big sagebrush, is stable. Population density has declined slightly since 1999, but most plants display normal vigor, good leader growth and seed production. Trend for the herbaceous understory is considered down slightly. The dominant perennial grass, Salina wildrye, is stable but the more preferred bluebunch wheatgrass, declined significantly in nested frequency. Forbs are not abundant but have also declined in sum of nested frequency values. The Desirable Components Index rated this site as fair with a score of 63 due to low shrub cover, low perennial forb cover, but had a high amount of young shrubs.

TREND ASSESSMENT
soil - down slightly (2)
browse - stable (3)
herbaceous understory - down slightly (2)
winter range condition (DC Index) - 63 (fair) Mountain big sagebrush type

HERBACEOUS TRENDS --
Management unit 16C, Study no: 13

Type	Species	Nested Frequency				Average Cover %		
		'88	'94	'99	'04	'94	'99	'04
G	Agropyron spicatum	$_{ab}$40	$_{c}$194	$_{b}$68	$_{a}$15	10.87	2.84	.34
G	Bromus tectorum (a)	-	-	-	3	-	-	.00
G	Carex spp.	$_{b}$15	$_{a}$5	$_{a}$5	$_{a}$4	.03	.06	.03
G	Elymus salina	$_{c}$279	$_{a}$80	$_{b}$229	$_{b}$232	3.08	19.46	22.56
G	Koeleria cristata	-	-	2	-	-	.00	-
G	Poa pratensis	-	-	1	-	-	.06	-
Total for Annual Grasses		0	0	0	3	0	0	0.00
Total for Perennial Grasses		334	279	305	251	13.98	22.43	22.93
Total for Grasses		334	279	305	254	13.98	22.43	22.93
F	Achillea millefolium	$_{a}$-	$_{a}$2	$_{b}$9	$_{a}$2	.03	.23	.03
F	Alyssum alyssoides (a)	-	-	-	2	-	-	.00
F	Antennaria microphylla	-	3	-	-	.03	-	-
F	Artemisia ludoviciana	$_{a}$-	$_{ab}$3	$_{b}$6	$_{ab}$3	.15	.07	.04
F	Astragalus convallarius	2	12	19	2	.07	.88	.03
F	Aster spp.	$_{a}$39	$_{b}$76	$_{b}$73	$_{a}$45	1.02	2.49	.68
F	Astragalus spp.	-	4	-	-	.18	-	-
F	Chenopodium album (a)	-	$_{ab}$2	$_{a}$-	$_{b}$9	.00	-	.05
F	Chaenactis douglasii	-	4	-	-	.01	-	-
F	Cirsium spp.	-	1	-	-	.03	.00	-
F	Descurainia pinnata (a)	-	$_{a}$-	$_{a}$-	$_{b}$59	-	-	.15
F	Hymenoxys richardsonii	1	-	-	-	-	-	-
F	Ipomopsis aggregata	-	-	1	-	-	.00	-
F	Lappula occidentalis (a)	-	$_{a}$-	$_{a}$-	$_{b}$30	-	-	.17
F	Machaeranthera canescens	4	5	11	1	.22	.13	.01
F	Phlox longifolia	$_{a}$-	$_{ab}$6	$_{b}$11	$_{b}$15	.01	.02	.05
F	Sanguisorba minor	-	-	-	-	-	.00	-
F	Schoencrambe linifolia	-	3	-	5	.00	-	.01
F	Taraxacum officinale	1	-	-	-	-	-	-
Total for Annual Forbs		0	2	0	100	0.00	0	0.38
Total for Perennial Forbs		47	119	130	73	1.77	3.86	0.87
Total for Forbs		47	121	130	173	1.78	3.86	1.25

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 16C, Study no: 13

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	Artemisia tridentata vaseyana	44	49	39	4.25	8.53	5.19
B	Cercocarpus ledifolius	7	5	4	.15	.00	.06
B	Chrysothamnus nauseosus	0	0	1	-	-	.03
B	Chrysothamnus viscidiflorus viscidiflorus	1	4	2	.00	.30	.15
B	Gutierrezia sarothrae	0	2	2	-	.03	.03
B	Juniperus osteosperma	0	0	1	.63	-	.41
B	Mahonia repens	65	60	69	2.47	3.85	1.87
B	Pachistima myrsinites	1	2	2	-	.09	.03
B	Sambucus cerulea	0	2	1	-	-	.00
B	Symphoricarpos oreophilus	6	5	3	.06	.53	.18
Total for Browse		124	129	124	7.58	13.34	7.98

CANOPY COVER, LINE INTERCEPT --
Management unit 16C, Study no: 13

Species	Percent Cover '04
Artemisia tridentata vaseyana	7.36
Gutierrezia sarothrae	.03
Juniperus osteosperma	.15
Mahonia repens	1.96
Sambucus cerulea	.16

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 16C, Study no: 13

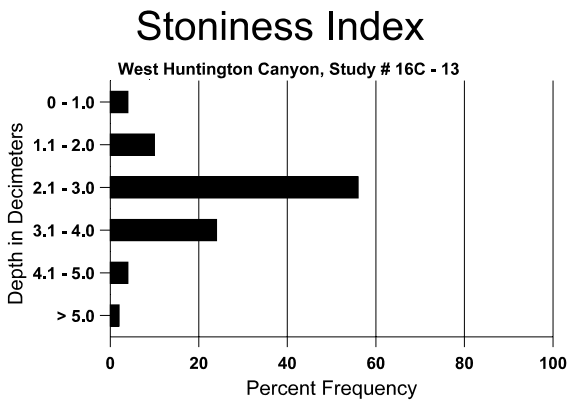
Species	Average leader growth (in) '04
Artemisia tridentata vaseyana	2.2
Cercocarpus ledifolius	5.4

BASIC COVER --
Management unit 16C, Study no: 13

Cover Type	Average Cover %			
	'88	'94	'99	'04
Vegetation	10.25	24.57	40.22	32.04
Rock	10.00	9.04	10.68	10.93
Pavement	1.25	1.21	5.88	6.56
Litter	53.00	32.40	33.01	25.82
Cryptogams	0	.04	.00	.00
Bare Ground	25.50	30.77	25.76	40.09

SOIL ANALYSIS DATA --
Management unit 16C, Study no: 13, Study Name: West Huntington Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
16.3	53.3 (10.9)	7.4	23.3	32.2	44.6	3.2	5.5	99.2	0.7



PELLET GROUP DATA --
Management unit 16C, Study no: 13

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	13	7	-
Elk	47	54	39
Deer	4	6	3

Days use per acre (ha)	
'99	'04
-	-
96 (237)	131(322)
10 (25)	27 (66)

BROWSE CHARACTERISTICS --
Management unit 16C, Study no: 13

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Artemisia tridentata vaseyana												
88	**3466**	1600	2000	1266	200	-	2	0	6	-	4	13/21
94	**1520**	-	120	1200	200	-	18	1	13	9	9	20/32
99	**1760**	40	220	1380	160	100	39	8	9	1	1	16/24
04	**1260**	300	40	1020	200	180	30	13	16	10	10	12/22
Cercocarpus ledifolius												
88	**66**	-	66	-	-	-	100	0	-	-	0	-/-
94	**260**	-	180	80	-	20	0	0	-	-	0	27/18
99	**140**	-	60	80	-	40	43	43	-	-	0	15/14
04	**100**	-	60	40	-	40	20	80	-	-	0	17/17
Chrysothamnus nauseosus												
88	**0**	-	-	-	-	-	0	0	0	-	0	-/-
94	**0**	-	-	-	-	-	0	0	0	-	0	11/15
99	**0**	-	-	-	-	-	0	0	0	-	0	29/53
04	**20**	-	-	-	20	-	0	0	100	-	0	19/53
Chrysothamnus viscidiflorus												
88	**132**	-	66	66	-	-	0	0	-	-	0	10/10
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus												
88	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**20**	-	-	20	-	-	0	0	-	-	0	10/15
99	**120**	-	-	120	-	-	0	0	-	-	0	9/14
04	**40**	-	-	40	-	-	0	0	-	-	0	7/18
Gutierrezia sarothrae												
88	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**80**	-	-	80	-	-	0	0	-	-	0	8/12
04	**60**	-	-	60	-	-	0	0	-	-	0	7/8
Juniperus osteosperma												
88	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**20**	-	20	-	-	-	0	0	-	-	0	-/-

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Mahonia repens												
88	**43466**	12666	9533	33933	-	-	0	0	-	-	0	5/4
94	**16740**	-	1120	15620	-	-	0	0	-	-	0	9/12
99	**19420**	260	5980	13440	-	-	.20	0	-	-	0	4/5
04	**4620**	-	300	4320	-	-	0	0	-	-	0	3/5
Pachistima myrsinites												
88	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**20**	-	-	20	-	-	0	0	-	-	0	3/2
99	**60**	-	60	-	-	20	0	0	-	-	0	9/9
04	**40**	20	-	40	-	-	0	0	-	-	0	6/7
Sambucus cerulea												
88	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	40/52
99	**240**	-	160	80	-	-	0	0	-	-	0	57/68
04	**20**	-	-	20	-	-	0	100	-	-	0	47/45
Symphoricarpos oreophilus												
88	**200**	-	200	-	-	-	0	0	0	-	0	-/-
94	**160**	-	-	160	-	-	0	0	0	-	0	11/26
99	**100**	-	-	100	-	-	0	0	0	-	0	14/26
04	**80**	-	-	60	20	-	0	0	25	25	25	11/26